

# SEQUENCE LISTING



<110> Miller, Brian S.  
Shetty, Jayarama K.

<120> Modified Forms of Pullulanase

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<140> 09/262,126

<141> 1999-03-03

<160> 9

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<212> DNA

<213> B. deramificans

<221> misc\_feature

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 Thr Thr Thr Ile Ile Val His Tyr Phe Cys Pro Ala Gly Asp Tyr Gln  
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 Pro Trp Ser Leu Trp Met Trp Pro Lys Asp Gly Gly Gly Ala Glu Tyr  
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 Asp Phe Asn Gln Pro Ala Asp Ser Phe Gly Ala Val Ala Ser Ala Asp  
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 Ile Pro Gly Asn Pro Ser Gln Val Gly Ile Ile Val Arg Thr Gln Asp  
 85 90 95  
 Trp Thr Lys Asp Val Ser Ala Asp Arg Tyr Ile Asp Leu Ser Lys Gly  
 100 105 110  
 Asn Glu Val Trp Leu Val Glu Gly Asn Ser Gln Ile Phe Tyr Asn Glu  
 115 120 125  
 Lys Asp Ala Glu Asp Ala Ala Lys Pro Ala Val Ser Asn Ala Tyr Leu  
 130 135 140  
 Asp Ala Ser Asn Gln Val Leu Val Lys Leu Ser Gln Pro Leu Thr Leu  
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 Gly Glu Gly Xaa Ser Gly Phe Thr Val His Asp Asp Thr Ala Asn Lys  
 165 170 175  
 Asp Ile Pro Val Thr Ser Val Lys Asp Ala Ser Leu Gly Gln Asp Val

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Tyr	Gln	Ala	Lys	Gln	Val	Ile	Pro	Arg	Asn	Val	Leu	Asn	Ser	Ser	Gln
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Trp Asp Arg Arg Glu Thr	Phe Lys Glu Asp Val His	Tyr Ile Arg Arg
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Ala Asp Ile Gln Arg His	Leu Glu Cys Leu Thr	Leu Lys Glu His Leu
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Ile Ala Tyr Arg Leu Tyr	Asp Leu Asp Glu Val	Asp Glu Trp Lys Asp
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Ile Ile Val Ile His His	Ala Ser Pro Asp Ser Val	Glu Trp Arg Leu
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Pro Asn Asp Ile Pro Tyr	Arg Leu Leu Cys Asp Pro	Ser Gly Phe Gln
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Glu Asp Pro Thr Glu Ile	Lys Lys Thr Val Ala Val	Asn Gly Ile Gly
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Ser	Ala	Pro	Val	Ala	Asp	Trp	Asn	Asp	Val	Ser	Thr	Thr	Pro	Ser	Gly
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Val	Ile	Ala	Gly	Asn	Ser	Ala	Val	Tyr	Asp	Ser	Arg	Ala	Asp	Ala	Phe
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Arg	Ala	Ala	Phe	Gly	Val	Ala	Leu	Ala	Glu	Ala	His	Trp	Val	Asp	Lys
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Ala Ala Ala Glu Asp Gly	Ile Leu Ile Ser Ala	Thr Gln Val Gln Thr
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Ala Gly Val Leu Asp Asp	Ala Tyr Ala Glu Ala	Ala Glu Ala Leu Ser
290	295	300
Tyr Gly Ala Gln Leu Ala	Asp Gly Gly Val Thr	Phe Arg Val Trp Ala
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Pro Thr Ala Gln Gln Val	Asp Val Val Val Tyr	Ser Ala Asp Lys Lys
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Val Ile Gly Ser His Pro	Met Thr Arg Asp Ser	Ala Ser Gly Ala Trp
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Ser Trp Gln Gly Gly Ser	Asp Leu Lys Gly Ala	Phe Tyr Arg Tyr Ala
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Val Val Asp Leu Asn Asp	Ser Ala Leu Lys Pro	Asp Gly Trp Asp Asn
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Ser Asn Met Val Gln His	Leu Lys Thr Leu Ser	Ala Ser Gly Val Thr
465	470	475
His Val Glu Leu Leu Pro	Val Phe Asp Leu Ala	Thr Val Asn Glu Phe
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Val Asn Ser Ala Val Lys	Ser Ser Glu Phe Ala	Gly Tyr Cys Asp Ser
515	520	525
Gly Ser Thr Val Glu Glu	Val Leu Asn Gln Leu	Lys Gln Ser Asp Ser
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Asp Ser Tyr Asn Trp Gly	Tyr Asp Pro Phe His	Tyr Thr Val Pro Glu
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Gly Ser Tyr Ala Thr Asp	Pro Glu Gly Thr Thr	Arg Ile Lys Glu Phe
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Arg Thr Met Ile Gln Ala	Ile Lys Gln Asp Leu	Gly Met Asn Val Ile
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Met Asp Val Val Tyr Asn	His Thr Asn Ala Ala	Gly Pro Thr Asp Arg
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Thr Ser Val Leu Asp Lys	Ile Val Pro Trp Tyr	Tyr Gln Arg Leu Asn
625	630	635
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Pro Glu His Arg Met Phe	Ala Lys Leu Ile Ala	Asp Ser Leu Ala Val
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